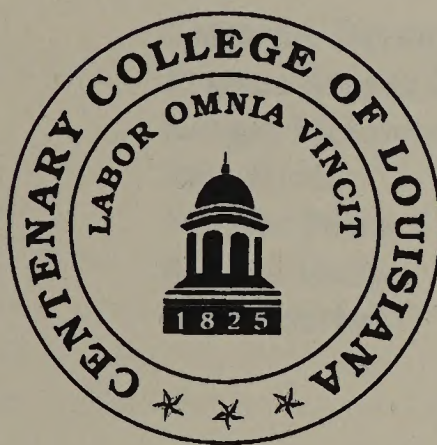


**CENTENARY COLLEGE
OF
LOUISIANA**



STUDENT RESEARCH FORUM

**FRIDAY, APRIL 18, 1997
KILPATRICK AUDITORIUM**

CENTENARY COLLEGE STUDENT RESEARCH FORUM

Sponsored by The Muses and Provost & Dean of the College

12:55	Opening
1:00	Lynd Matt
1:15	Emily Glass
1:30	Dennis Myatt
1:45	Summer Neel
2:00	Sona Patel

2:15 - 2:45 BREAK

2:45	Catherine Dayton
3:00	Frances Reagan Hardy
3:15	Keegan McConnell
3:30	John Hyatt
3:45	Jennifer Pearson
4:15	Richard Hasty
4:30	Chad Quarles

Director
Dr. Yvonne Ilke Yaz

Judges
Dr. Sue Hernandez
Dr. Jerry Lisantti
Dr. George Newtown

RESEARCH PAPERS

The Identity and Characteristics of Successful Ministries with Inner-City Youth

*LYND MATT

Department of Religion, Humanities Division

The identity and characteristics of various ministries which find success with youth who live in America's inner cities possess similarities. Many of America's churches seem to be focused on creating ministries with youth who hail from middle class, suburban families, often overlooking the fact that youth who spend their lives in the inner cities of our country possess very different needs from their suburban counterparts. Many well-meaning churches and civic organizations embark upon the difficult journey of attempting to minister *to* urban youth only to give up quickly in frustration. Little or no thought is given to the true need of the situation. In contrast, successful programs in this area seem to share ideas and methods by which they participate *in* ministry with urban youth. In this paper, I will attempt to identify some of these characteristics based upon several examples of programs which assist in meeting the needs of inner-city youth.

The Right to Advertise

*EMILY GLASS

Communication, Division of Humanities

The creation of the Constitution was an act to guarantee certain freedoms for citizens of the United States. The First Amendment gives all citizens the right to freedom of speech, but recently its boundaries are in question. How much freedom should advertisers have to promote certain products? Alcohol and cigarette companies now battle the government's scrutiny of their promotion of products to youth. The conflicts between the alcohol and cigarette producers and the federal government grow as more research proves that these products are harmful to the public's health. Other advertisers face scrutiny for crude marketing strategies and sexist representations of women. Is the First Amendment strong enough to protect advertisers from worried parents, or should the right to freedom of speech be disregarded when concerning health and morality issues.

Changing the Face of the World: Beauty as Cultural Imperialism

*DENNIS MYATT

Communications: Professional Writing, Humanities Division

It is my goal to explore some of the ideological effects of western oriented advertisement on non-western women. I will provide opinions of several women from different backgrounds from around the world on how Western Media has propagated the Western ideal of beauty. Also, I intend to explore the ideological nature of advertisement.

Then, I will look at a nation in an ideological transition: Japan

Fat or Fiction: How the Media Encourages Eating Disorders

***SUMMER NEEL**

Communication, Division of Humanities

Unquestionably, the media shape and define the cultural ideal of female beauty. While attractive before she ever became a star, Marilyn Monroe did not become an icon until she made her Hollywood debut. Soon, every man in the world wanted Marilyn Monroe, and every woman wanted to look just like her. When the icon changes, so does our cultural ideal for the female body. Consequently, the media define how women want to look. Over the past few decades, the media have remained constant concerning only one characteristic of feminine beauty, thinness. Our icons have become thinner and thinner, and women are trying to attain this goal through any means necessary. The rapid increase in eating disorders is largely due to the unrealistic thinness of our media beauties.

Opposition and Change in D.H. Lawrence's Sons and Lovers

***SONA PATEL**

English Department, Humanities Division

Lawrence is often accused of writing misogynist novels that tend to portray women in a decidedly negative light. However, Sons and Lovers is not such a novel. The female characters, Clara and Miriam, go through a positive change, while the main male character, Paul, seems to go through no change at all. While Miriam becomes independent and whole, and Clara becomes accepting, Paul remains a site of oppositions that the novel creates. He does not achieve any significant change and remains torn between opposing concepts.

Behavioral Changes in Cicada Killer Wasps (*Sphecius Speciosus*)

During the Mating Season

***CATHERINE B. DAYTON**

Department of Biology, Science Division

Cicada killers (*Sphecius Speciosus*) are large wasps found throughout the United States. Females are mated upon emergence and begin digging burrows shortly afterwards. Females provisioning their burrows are still accosted by males, despite being unavailable for mating. This study examines if and how the wasps' behavior changes in response to the declining male population as the mating season progresses. I monitored frequency and duration of flight level (high vs low), burrow entries and exits, grooming, sitting, walking, and digging for the females. I also recorded acts of aggression for both sexes as "hits," grapples, chases, and retreats. Of the behavioral acts examined, male hits against females showed the greatest change over time, and exiting the burrows by the females showed a slight change over time. In addition, the intensity of male aggression increased during the mating season.

RESEARCH PAPER
**Metabolism Changes in Mus musculus
Before, During, and After Estrus
*F.R. HARDY**

Biology Department, Science Division

My hypothesis was that oxygen consumption (ml/g/hr) would increase during estrus in laboratory mice (Mus musculus). I used 7 female mice, and over a 4-month period, I measured the carbon dioxide output of each female mouse using a metabolism chamber. The amount of carbon dioxide expired (which equals the amount of oxygen consumed) was recorded and then analyzed using an analysis of variance (ANOVA). The one-way statistical ANOVA results demonstrated that oxygen consumption (ml/g/hr) during estrus (7.13 ± 1.0) for the subjects was significantly different from pre-estrus (5.41 ± 0.9) and post-estrus (5.82 ± 0.5). It can therefore be inferred that the increase in metabolism during estrus is advantageous in aiding each female's reproductive success. It is advantageous possibly by making her more active during her search for males or as a mechanism for preparing her body for the rigors of pregnancy.

**Exercising the Abdominals
Out with the Old and In With the New
*KEEGAN McCONNELL**

Applied Science & Health & Exercise Science, Natural & Social Sciences Division

LOGAL software and electromyography probes were used to record the electrical activity of the rectus abdominis, a major abdominal muscle, in the three following abdominal exercises: (1) straight leg sit-ups, (2) bent leg sit-ups, and (3) crunches. I tested the hypothesis that there will be no differences in electromyographic activity in the rectus abdominis regardless of exercise type. However, the data indicate that crunches produce sustained electrical activity compared to straight leg and bent leg sit-ups.

**Photophysics of the Dissociation of Trimethyldioxetane
From High Vibrational Levels
*JOHN D. HYATT and THOMAS M. TICICH
Department of Chemistry, Natural Sciences Division**

This study examines the photophysics of trimethyldioxetane excited to high vibrational levels through direct overtone excitation. The subsequent dissociation of the vibrationally excited molecule releases sufficient energy to electronically excite one of the products (acetone and acetaldehyde). The decay portion of the resulting luminescence reflects the lifetime and hence identifies the electronically-excited photofragment.

We observe that dissociation from the $v=4$ state of the C-H stretching vibration produces acetone exclusively, whereas dissociation from the $v=5$ state produces predominately acetaldehyde. Dissociation from the first excited electronic state of the dioxetane produces acetaldehyde exclusively. These results have important implications for the potential energy curves for the dissociation process.

The Impact of Hydrocarbon and Saltwater Spillage on Water and Sediment in the Caddo Lake Region, Louisiana

***JENNIFER PEARSON**

Department of Geology, Natural Sciences Division

Areas of Caddo Lake, LA experienced severe hydrocarbon and saltwater spillage during the early 20th century. Historic records were reviewed to determine the magnitude of spillage that may have occurred. Sediment and water sampling from the portion of Caddo Lake with the most oil production, known as James Bayou, as completed over a two-month period from June to July 1996. Lake sediment was cored from areas of past spillage. Careful sediment description and basic measurements of sediment organic content and pore salinity, supplemented by study of state records of reported spills, resulted in successful recognition of major oil and saltwater spills recorded in the sediment record.

Energy Levels in Ni 58

***RICHARD HASTY, JERRY LISANTTI**

Physics Department, Natural Sciences Division

In a nuclear physics experiment, protons were scattered off of a nickel target. The ultimate purpose of the experiment is to elucidate the energy levels within the nickel nucleus and to better understand the nature of the nuclear force. Data is taken at different scattering angles over a range of energies. The number of protons detected at each energy is recorded. In the course of the semester, I have setup a system for analyzing the data. The main objective is to identify the energy of peaks in the data, and determine the number of counts in each peak. I wrote a script that uses the fitting tools in Goupset 3.5 to fit the data. I identify the peaks in a region of the data, and fit a Gaussian function to each peak.

Computer Programming: A Necessity For Medical Innovations

***CHAD QUARLES, JUAN RODRIGUEZ**

Department of Physics, Natural Sciences Division

Optical Tomography is a non-invasive medical imaging method that is currently being developed at Centenary and other laboratories around the world. In this talk I will describe the principle behind this emerging technology and some of the current technical challenges we face in our laboratory, including computer simulations of light propagation in tissue and the high transfer rate of information from the detecting device to the computer.

POSTERS

The Effects of Body Composition on Heart Activity in College-Age Females

*TREVA L. ARMSTRONG

Department of Biology, Natural Sciences Division

Twenty college-age females were measured for fat composition in the suprailium, thigh, and triceps brachi regions with a skinfold caliper. The subjects' electrocardiograms (ECG) were recorded during rest, during exercise on an ergometer (exercise bike), and during recovery. The average change in voltage over the QRS-complex and the average time between each QRS-complex was measured. Individuals with $\leq 18\%$ body fat have the longest rest periods between QRS peaks during rest, exercise, and recovery periods. Individuals with 28.1-33% body fat had the shortest rest periods between QRS peaks under the same conditions. During exercise, there is a tendency towards the reduction in the time between QRS-complexes, which suggests an increase in stroke volume and a shorter time between contractions. Added adipose or fat decreases contraction time and hinders strength. Individuals with higher body fat have additional blood vessels in their adipose tissue. Thus the work load on the heart is increased due to the increased network of vessels. This work load translates into a more rapid, shallow heart beat in individuals with excess body fat.

Observing the Combined Effects of Ultraviolet Radiation and Water Pollution on the Salamander *Triturus viridescens*

*CATHERINE DAYTON

Department of Biology, Natural Sciences Division

Little attention has been directed at how adult amphibians are affected by pollution and ultraviolet radiation. I examined if adult salamanders (*Triturus viridescens*) suffer skin damage from UV radiation, and what effects added water pollution may contribute. I collected water samples from two East Texas locations, both above and below a chicken processing plant, and determined pollution levels for each by measuring dissolved oxygen, total dissolved solutes, pH, temperature, conductivity, and nitrogen and phosphate levels. I placed salamanders into tanks of the water samples and exposed them to UV radiation daily. I measured snout-vent length and weight every other day until day 11. I sacrificed the salamanders and measured skin lesions on the final day. Longitudinal growth and weight gain/loss were not significantly different across the groups. One group did show significantly larger skin lesions than the others. All salamanders suffered dark lesions and blisters.

Changes in *Brachydanio rerio* Metabolism Due to Exposure to Aggressive Fish

*DAVID KING

Department of Biology, Natural Sciences Division

The metabolism of the fish *Brachydanio rerio* was measured in three testing situations: during normal activity, after exposure to *Cichlosoma octofasciatum*, and after

exposure to *Betta splendens*. The latter two species are considered highly aggressive fish. I hypothesized that the *Brachydanio* would show a greater rise in metabolism after exposure to *Cichlosoma* than after exposure to the *Betta*. Changes in metabolism were measured against the normal activity metabolism. It was shown that exposure to the *Betta* caused a significant rise in metabolism, but *Cichlosoma* exposure did not. The significance of the *Betta* exposure metabolism could be the result of the similarity in size and shape of the *Brachydanio* and *Betta*. Due to the experimental conditions, the two exposure metabolisms could not be compared.

The Physiological Effects of Test Anxiety in College Freshmen vs. Seniors

***ARIE LANDRY**

Department of Biology, Natural Sciences Division

This research project confronts the question of what test anxiety does to our bodies. The predictions made were that freshmen would show more signs of stress than seniors, and that test anxiety would have an effect on physiological data. There were four subject groups in this experiment, freshmen males, freshmen females, senior males, and senior females. The physiological data of these students was taken on a day of which they had a test and also on a non-test day. The variables that were measured included pulse, blood pressure, temperature, and breathing rate. The three factors of sex, testing situation, and class rank had different effects when the data were analyzed using analysis of variance. Temperature and pulse were significantly different on test vs. non-test days. The data indicated that freshmen were more influenced by tests than seniors, pulse seemed to be the best indicator of test anxiety, and systolic blood pressure, pulse, and temperature were influenced by class rank rather than testing situation.

Metabolism of *Manduca sexta* on Tomato Plants Grown in Three Soils

***CALLIE STANLEY**

Department of Biology, Natural Sciences Division

Use of chicken litter as fertilizer is rapidly becoming a widespread practice in southern states. The contents of the manure may vary widely depending on what the chickens are fed. Many chicken feeds are high in arsenic and copper sulfate (for quick growth and yellowish meat), leading to high concentrations of these heavy metals in the manure as well. I wanted to see what effect such a fertilizer might have on the growth of an animal, specifically the tobacco hornworm *Manduca sexta*. I assumed that the metabolism of the *Manduca sexta* would not differ significantly from worms grown on tomato plants in other manures and soils, but found something quite different. The hornworm's metabolism was significantly different in between the chicken litter group and the control group on day one, but not on day three. I concluded that the chicken hornworms were most likely subdued by the high amounts of nutrients and/or metals in the litter and in the plant on day one. By day three however, probably enough of the nutrients and metals in the small pots had been used by the plant, that the hornworms on chicken litter were able to recuperate somewhat.

Potential Heavy Metal Contamination from Mine Tailings

Zimapan Mining District, Mexico

***CARRIE FERGUSON**

Geology Department, Natural Sciences Division

Within the Zimapan Mining District in the state of Hidalgo, Mexico, the water supply is known to be contaminated with arsenic. Surface and shallow wells have been tested within the district, with the majority showing arsenic levels well above the legal limit of .050 ppm. The contamination may come from several sources. One source may be the underlying strata, which contains many arsenic-bearing minerals, such as arsenopyrite. Another source may be mine tailings ranging in age from 300 years to the present. These piles are present throughout the district and are quite large.

This study examines the possibility of contamination occurring as a result of the mine tailings. Emphasis is placed on the amount of contamination, as well as the quantity of contamination incurred. The first course of analysis was the analysis of the samples of eight heavy metals: As, Pb, Se, Cd, Ag, Ba and Cr. The results of this analysis revealed extremely high levels of arsenic as well as lead. The second method of analysis was to introduce water to the samples to form a leachate. After various time constraints, the leachate was examined for the same eight minerals. These results showed high arsenic and lead levels as well.

The Geochemistry of the Banbury Basalts of the King Hill Area of Southern Idaho

***SCOTT MATTHEWS, SCOTT VETTER**

Dr. JOHN SHERVAIS, University of South Carolina

Dr. BARRY B. HANAN, San Diego State University

Department of Geology, Natural Sciences Division

The Snake River Plain (SRP) of southern Idaho has long been associated with the concept of a hot-spot (mantle plume) track which links voluminous flood basalts of the Miocene Columbia River province to Quaternary volcanic centers at Island Park and Yellowstone. A major problem with a plume model, however, is that it does not explain the origin of volcanic rocks which do not lie on the Yellowstone hot-spot track which includes thick sections of basalts in the western Snake River Plain. Basalts from the western SRP are in part coeval with volcanic rocks of the eastern SRP and continue well after the Yellowstone plume had moved to its present position on the Idaho-Wyoming border around 2.2 Ma.

This study investigates connections between the dynamics of mantle plumes and continental basalts by examining spatial and temporal variations in the chemistry of basaltic lavas found in the Snake River Plain along a transect between Mountain Home and Twin Falls, Idaho. This transect lies at the physiographic intersection of the Yellowstone plume tail track (eastern SRP trend) with the western SRP. Despite the apparent continuity of volcanism in these two parts of the Snake River Plain, the western SRP does not lie along the track of the Yellowstone plume and is structurally and tectonically distinct.

Selected samples from the transect are being analyzed for major and trace element geochemistry with a subset being chosen for isotopic analysis.

